TECHNICAL GUIDE

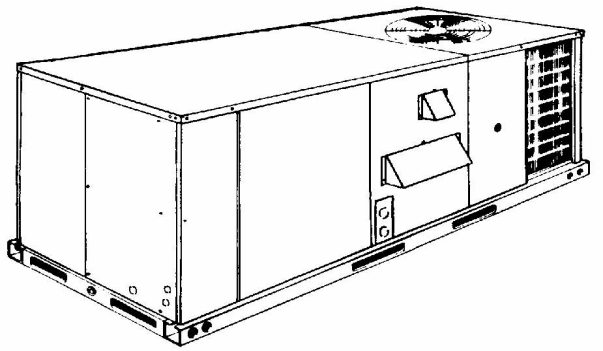
SUNLINE ULTRA™

SINGLE PACKAGE AIR-COOLED

AIR CONDITIONERS

3, 4 AND 5 NOMINAL TON

D1HE/D1HG036, 048 and D2HE/D2HG060
12.2 THROUGH 13.2 SEER



DHG MODEL SHOWN

FLEXIBLE LIGHT COMMERCIAL UNIT

GENERAL

YORK's Sunline Ultra package units are designed to handle applications ranging from residential to light commercial and any in between. The Sunline Ultra is a unit that gives you the flexibility and choices you need in today's market.

FEATURING

- COOLING ONLY UNITS
- COOLING/GAS HEATING UNITS (NATURAL GAS OR PROPANE)
- LOW PROFILE
- QUIET OPERATION
- COMMON FOOTPRINT
- OPTIONAL FACTORY INSTALLED ECONOMIZERS
- OPTIONAL SLIDE IN MOTORIZED DAMPERS
- OPTIONAL SLIDE IN ECONOMIZERS
- OPTIONAL ELECTRIC HEATERS
- OPTIONAL PROPANE CONVERSION KIT
- OPTIONAL HIGH ALTITUDE GAS OR PROPANE KIT
- OPTIONAL NOx KIT
- MODULAR ELECTRICAL CONNECTIONS FOR EASY OF INSTALLATION
- FULL PERIMETER BASE RAILS
- TROUBLE FREE UTILITY CONNECTIONS
- 1" OR 2" THROWAWAY FILTERS
- 5 YEAR LIMITED WARRANTY ON COMPRESSOR
- 10 YEAR LIMITED WARRANT ON GAS-FIRED HEAT EXCHANGERS
- 1 YEAR LIMITED WARRANTY ON ALL REPLACEMENT PARTS

FOR DISTRIBUTION USE ONLY - NOT TO BE USED AT POINT OF RETAIL SALE

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DESCRIPTION

YORK Sunline Ultra units are high efficiency, convertible, single package air conditioners with a common cabinet and a common roof curb for the 3, 4 and 5 ton sizes. The units were designed for residential, light commercial and commercial applications. They can easily be installed on a roof curb, slab, roof jack or frame.

All units are self-contained and assembled on rigid full perimeter base rails with fork lift slots on three sides and holes for overhead rigging. Every unit is completely piped, wired, charged and tested at the factory to provide for a quick and easy field installation.

The units are available in cooling only, and cooling with gas heat. Electric heaters are available as field--installed accessories.

Both bottom and side duct connections are available without having to swap panels. The installer simply removes the duct covers for the desired configuration. Economizers may be used on either bottom and side duct applications with no modifications required.

All models include a 5-year limited warranty on compressors, a 10-year limited warranty on gas-fired heat exchangers and a 1-year limited warranty on all replacement parts.

FEATURES

COMMON FOOTPRINT/COMMON CABINET - All model sizes and configurations share a common cabinet and a common roof curb. The installer has the flexibility of setting one curb and placing the proper tonnage unit on that curb after the internal load has been determined. He can even decide between gas or electric heat after the curb has been set.

HIGH EFFICIENCY - Units have a high cooling efficiency of as high as 13.2 SEER and gas / electric models have a minimum AFUE of 80.3%. All efficiencies exceed legislated minimum levels and provide low operating costs.

CONVERTIBLE AIRFLOW DESIGN - Both the side and bottom duct openings are covered when they leave the factory. If a side supply / side return is desired, you simply remove the two side duct covers from the outside of the unit and discard them. If a bottom supply / bottom return is desired, you simply remove the two knockout panels from the base of the unit and discard them. No panel cutting or swapping is required! Convertible airflow design allows maximum field flexibility and minimum inventory.

FACTORY--INSTALLED OPTIONS - Economizers can be installed at the factory. The economizers are shipped installed and wired. Only the rain hood needs to be field assembled and installed. Field labor dollars can be saved by having the components arrive already installed.

FIELD--INSTALLED ACCESSORIES - Accessories were designed for quick and easy installation. The motorized damper and economizers simply slide in, and electrical connections are made by modular plugs. Electric heaters mount easily, and knockouts are provided in the internal partitions to connect the elements to the control box single point kit.

The motorized air damper includes a slid-in/plug-in damper assembly with a rainhood and filters. The outdoor air dampers open when the indoor fan motor is energized. The damper is capable of providing 0% through 100% of outdoor return air opening.

The manual outdoor damper provides 0% through 35% or 0% through 100% of return air opening (field adjustable). Designed for duct mounted side or bottom supply/return applications. Includes rain hood assembly and filter.

The 14" high roof curb is shipped knocked down. An insulated deck is not required because the bottom of the unit is insulated.

Low ambient controls are available to provide stable unit operation at outdoor temperatures down to 0F.

Propane, high altitude and low NOx kits are also available to cover all gas heating applications.

WIDE RANGE OF INDOOR AIRFLOWS - All models operate over a wide range of design conditions with the use of belt--drive blowers. The variable pitch pulley on the blower motor can be adjusted to obtain the desired supply air CFM.

FULL PERIMETER BASE RAILS - The permanently attached base rails provide a solid foundation for the entire unit and protect the unit during shipment. The rails provide fork lift access from 3 sides, and rigging holes are also provided so that an overhead crane can be used to place the units on a roof.

SYSTEM PROTECTION - Internal overload protection is standard on all compressors. Every unit has a liquid line filter--drier, high and low pressure/loss of charge switches and a suction line freezestat to protect all system components. All units will provide cooling at ambient temperatures down to 45F.

UTILITY CONNECTIONS MADE EASY - Gas and electric utility knockouts are provided in the unit base as well as the side of the unit. A clearly identified location is provided to mount a field supplied electrical disconnect switch. Utility connections can be made quickly and with a minimum amount of field labor.

SIMPLE CONTROL CIRCUIT - A low voltage printed circuit board contains a compressor lockout indicator light and a low voltage terminal strip. An additional set of pin connectors is also provided to simplify the field interface of external controls. Mate-n-lock plug connectors are used where line and low voltage wires pass through internal bulkheads. This allows for easier troubleshooting and component replacement. The electrical control box is not located in the compressor compartment so the access cover can be removed for

troubleshooting without affecting the normal system operating pressures.

AIR FILTERS - Units are shipped with 1" throwaway filters. The unit filter racks can accommodate 1" or 2" filters without any modifications

FACTORY-INSTALLED OPTION

ECONOMIZERS: Units equipped with a factory-installed economizer option have dampers that are positioned by a spring return, fully modulating damper actuator and are capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is determined by a single input electronic enthalpy control or by a dual input electronic enthalpy control. Simultaneous compressor and economizer operation is also possible.

The single enthalpy system contains a sensor that monitors the outdoor air which automatically operates the damper actuator allowing the dampers to open or close.

The dual enthalpy system contains a second sensor that monitors both the temperature and the humidity of the return air in addition to the outdoor air sensor described for a single enthalpy system. The logic module compares the inputs from both sensors and switches to economizer operation whenever the outdoor air is cooler than the return air for maximum efficiency of the economizer system.

The economizer is completely wired and installed at the factory. Only the outdoor air hood, including its filters, need be assembled and installed in the field.

FIELD-INSTALLED ACCESSORIES

SINGLE INPUT ELECTRONIC ENTHALPY ECONOMIZER - Includes a slide-in / plug-in damper assembly with fully modulating spring return motor actuator capable of introducing up to 100% outdoor air, one outdoor air electronic enthalpy sensor and a rain hood with filters. The rain hood is painted to match the basic unit and must be field-assembled before installation. Economizer dampers are 2% low leakage type.

DUAL INPUT ELECTRONIC ENTHALPY ECONOMIZER - Includes the same damper system and rain hood with filters as described for a single enthalpy economizer except this accessory contains two enthalpy sensors. It uses a differential enthalpy control that compares the outdoor air versus the return air. The logic module then optimizes the economizer operation for additional savings over the single input economizer.

MOTORIZED AIR DAMPER - Includes a slid-in/plug-in damper assembly with a rainhood and filters. The outdoor air dampers open when the indoor fan motor is energized. The damper is capable of providing 0% through 100% of outdoor return air opening.

MANUAL OUTDOOR DAMPER - Provides 0% through 35% or 0% through 100% of return air opening (field adjustable). Designed for duct mounted side or bottom supply/return applications. Includes rain hood assembly and filter.

ELECTRIC HEATERS - Include nickel chromium elements, a terminal block, fuses (where required by UL), all the necessary connectors and hardware. All heaters utilize single point power supply hookup. Capacities from 5 KW thru 30 KW heating are available.

FUSE BLOCK KITS - These kits have a fuse box with a fuse block and fuses. They're available for all 460-3-60 volt heaters and 208/230-3-60 volt heaters 7 KW and smaller.

OUTDOOR THERMOSTAT - A 24-volt thermostat providing two stages of control for units equipped with electric heat accessories.

ROOF CURB - This 14" high full perimeter roof curb is shipped knocked down for field assembly and contains duct supports that can easily be

shifted for the desired unit duct arrangement. No insulated deck is required because the unit underside is insulated.

START ASSIST KIT - Provides increased starting torque for single phase units in areas with low voltage conditions. It contains a 12.5 OHM PTCR temperature resistor with a support clip and hardware for mounting.

LOW AMBIENT KIT - A head pressure controller maintains stable system operation by reducing the speed of the condenser fan motor when the outdoor temperature is between 45 and 0F. Condenser fan motors with ball bearings and heavier windings are also available for these low ambient applications.

ANTI-RECYCLE TIMER - A timer to prevent the unit compressor from short cycling. It assures a 5-minute off-time between compressor cycles.

PROPANE CONVERSION KIT - Converts a gas-fired heater from natural gas to propane. It contains main burner orifices, a pilot orifice and a regulator spring.

LOW NOx KIT (natural gas furnaces only) - Contains five stainless steel expanded metal sheets for mounting into the heat exchanger tubes to meet the California low nitrous oxide emission requirements.

HIGH ALTITUDE CONVERSION (NATURAL AND PROPANE) - Provides orifices for proper furnace operation at altitudes up to 6000 feet. For propane applications, the propane conversion kit will also be required.

GAS PIPING - This kit contains 1/2" pipe nipples, fittings and gas cock (including panel access gaskets) required for bottom gas supply connection with external shut-off.

OUTDOOR COIL GUARD - Consists of grille-type sections for installation over the outdoor coil to protect it from damage.

WALL THERMOSTAT - The units are designed to operate with 24-volt electronic and electro-mechanical thermostats.

All units can operate with single stage heat / single stage cool thermostats - with or without the economizer.

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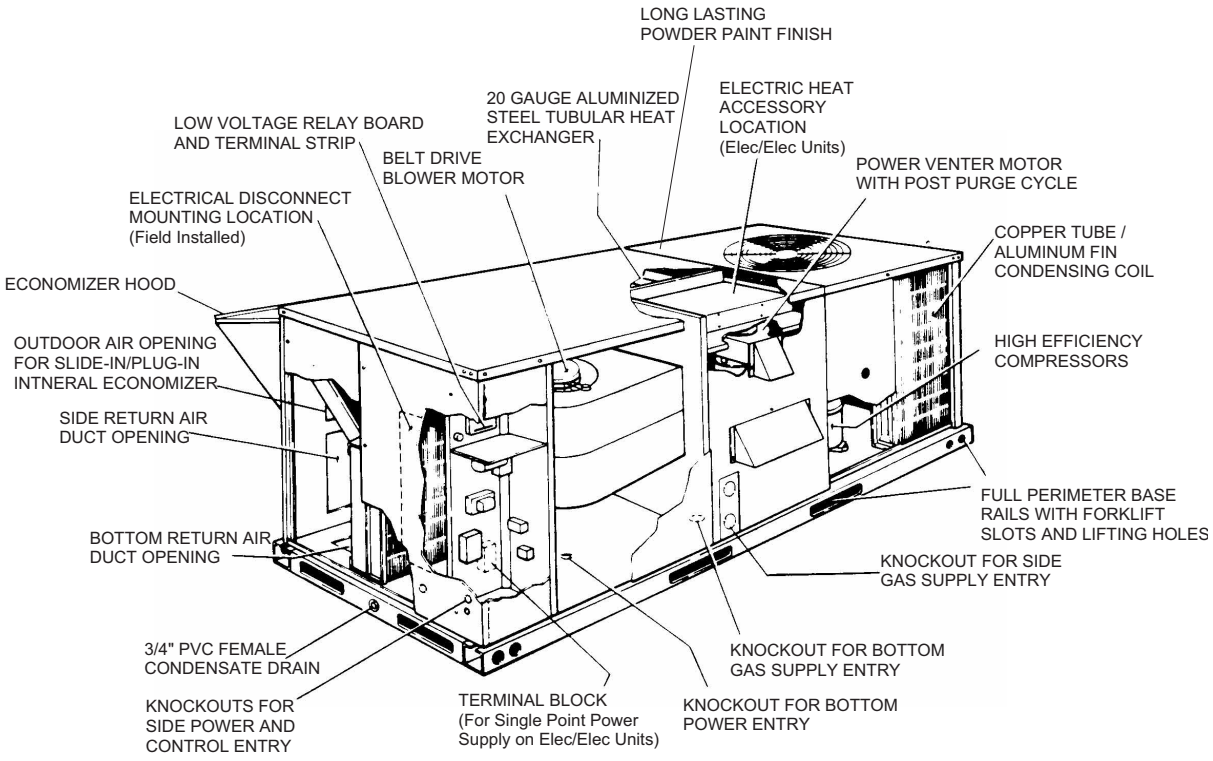


FIGURE 1 - SUNLINE ULTRA CUTAWAY (Model DHG gas heating)

TABLE 1: CAPACITY RATING - COOLING / ELECTRIC HEAT

MODEL	ARI RATINGS[1]				NOMINAL ELECTRIC HEAT CAPACITY[2] (kW)	
	COOLING CAPACITY 80 / 67-95°F			SOUND RATING[3] (dBels)		
	MBH	SEER[4]	EER[5]		240V	480V
DHE036	42.5	12.25	11.10	86	5, 7, 10, 15 & 20	7, 10, 15 & 20
DHE048	46.5	13.20	11.40	87		
DHE060	57.0	12.20	10.60	86	5, 7, 10, 15, 20 & 30	7, 10, 15, 20 & 30

1. Certified in accordance with the Unitary Small Equipment certification program, which is based on ARI Standard 210/240.
2. Heaters are available as accessories - all with single point power supply.
3. Rated in accordance with ARI Standard 270.
4. SEER = Seasonal Energy Efficiency Ration - the total cooling output in BTU's during a normal annual usage period for cooling divided by the total electric power input in watt-hours during the same period.
5. EER = Energy Efficiency Ration - the cooling capacity in Btu's per hour (Btuh) divided by the power input in watts at any given set of rating conditions, expressed in BTUH per watt (BTUH/watt).

TABLE 2: CAPACITY RATINGS - COOLING / GAS HEATING

MODEL	ARI RATINGS[1]				GAS HEAT CAPACITY						
	COOLING CAPACITY 80 / 67-95°F			SOUND RATING[2] (dBels)	INPUT (MBH)	DOE OUTPUT (MBH)	AFUE[3] (%)	S.S.E.[4] (%)	S.E.[5] (%)	TEMP. RISE (°F)	GAS LINE SIZE (in. O.D.)
	MBH	SEER[6]	EER[7]								
DHG036N040	42.5	12.25	11.1	86	50	40	80.0	81.6	77.3	15-45	1/2
DHG036N079	42.5	12.25	11.1	86	100	79	80.5	80.8	77.9	40-70	1/2
DHG048N060	46.5	13.20	11.40	87	75	59	80.9	81.6	77.3	25-55	1/2
DHG048N099					125	99	80.3	80.6	77.9	45-75	1/2
DHG060N079	57.0	12.20	10.60	86	100	79	80.5	80.8	73.6	25-55	1/2
DHG060N099					125	99	80.3	80.6	77.9	35-65	1/2

1. Certified in accordance with the Unitary Small Equipment certification program, which is based on ARI Standard 210/240.
2. Rated in accordance with ARI Standard 110, utilization range “A”.
3. AFUE = Annual Fuel Utilization Efficiency - determined in accordance with DOE test procedure.
4. S.S.E. = Steady State Efficiency. (Percent Output)
5. S.E. = California Seasonal Efficiency - determined in accordance with test procedures as specified by the State of California Energy Commission. Furnaces are available with a low NOx accessory.
6. SEER = Seasonal Energy Efficiency Ratio - the total cooling output in BTU’s during a normal annual usage period for cooling divided by the total electric power input in watt-hours during the same period.
7. EER = Energy Efficiency Ratio - the cooling capacity in Btu’s per hour (Btuh) divided by the power input in watts at any given set of rating conditions, expressed in BTUH per watt (BTUH/watt).

TABLE 3: SOUND POWER RATINGS[1]

UNIT SIZE	CFM	ESP	BLOWER		SOUND POWER (dB 10^{-12} Watts)									
					OCTAVE BAND CENTERLINE FREQUENCY (Hz)								SWL dB(A)	dBA @ 10 ft.[2]
		IWG	SPEED	kW	63	125	250	500	1000	2000	4000	8000		
036	1200	0.60	LOW	0.60	84	84	74	67	69	62	57	52	74	41
048	1600	0.55	HIGH	0.80	85	85	75	68	70	63	58	53	75	42
060	2000	0.45	HIGH	1.00	86	86	76	69	71	64	59	54	76	43

1. These values have been accessed using a model of sound propagation from a point source into the hermispheric free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacturer has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value or sound data in any other form than sound power level ratings.
2. At a distance of 10 feet from the blower.

TABLE 4: PHYSICAL DATA - BASIC UNIT

MODELS		DHE/DHG		
		036	048	060
EVAPORATOR BLOWER	CENTRIGUGAL BLOWER (Dia. x Wd. in.) FAN MOTOR HP (BELT-DRIVE)	12 x 10 1.5	12 x 10 1.5	12 x 10 1.5
EVAPORATOR COIL	ROWS DEEP FINS PER INCH FACE AREA (Sq. Ft.)	4 13 4.3	4 13 5.1	4 13 5.1
CONDENSER FAN	PROPELLER DIA. (in.) FAN MOTOR HP NOM. CFM TOTAL	24 1/2 4,500	24 1/2 4,200	24 1/2 4,200
AIR FILTERS[1]	QUANITY PER UNIT (15” X 20” X 1”) QUANTITY PER UNIT (14” X 25” X 1”) TOTAL FACE AREA (square feet)	2 1 6.6	2 1 6.6	2 1 6.6
SYSTEM CHARGE	REFRIGERANT 22 (pounds/ounces)	10/8	10/*4	10/14
COMPRESSOR	QUANTITY PER UNIT (Hermetic Type)	1 / Recpt.	1 / Recpt.	1/Recpt.

1. Filter racks are adapted for 1” or 2” thick filters.

TABLE 5: COOLING CAPACITIES - MODELS DHE/DHG 036 - 85°F - 95ºF

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL								
		85°F								
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68
1500	72	55.2	3.18	35.2	30.7	26.2	21.8	17.3	#N/A	#N/A
	67	49.1	3.13	41.7	37.2	32.8	28.3	23.8	19.4	14.9
	62	44.7	3.05	44.7	43.6	39.1	34.6	30.1	25.7	21.2
	57	42.4	3.05	42.4	42.4	42.4	37.9	33.4	29.0	24.5
1350	72	55.2	3.18	35.2	30.7	26.2	21.8	17.3	#N/A	#N/A
	67	49.1	3.13	41.7	37.2	32.8	28.3	23.8	19.4	14.9
	62	44.7	3.05	44.7	43.6	39.1	34.6	30.1	25.7	21.2
	57	42.4	3.05	42.4	42.4	42.4	37.9	33.4	29.0	24.5
1200	72	51.9	-3.15	30.0	26.5	23.0	19.5		16.0	#N/A
	67	46.1	3.10	35.7	32.2	28.7	25.2	21.7	18.2	14.7
	62	42.0	3.02	41.2	37.7	34.2	30.7	27.2	23.7	20.2
	57	39.8	3.03	39.8	39.8	37.3	33.8	30.3	26.8	23-3
1050	72	49.4	3.12	27.3	24.3	21.2	182		15.2	#N/A
	67	43.9	3.07	32.6	29.6	26.5	23.5	20.5	17.4	14.4
	62	40.0	2.99	37.7	34.7	31.6	28.6	25.6	22.5	19.5
	57	37.9	3.00	37.9	37.0	34.5	31.4	28.4	25.4	22.3
900	72	46.9	3.09	24.6	22.1	19.5	16.9	14.4	#N/A	
	67	41.7	3.04	29.5	26.9	24.4	21.8	19.2	16.7	14.1
	62	38.0	2.96	34.2	31.6	29.1	26.5	23.9	21.4	18.8
	57	36.0	2.97	36.0	34.2	31.7	29.1	26.5	24.0	21.4

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL								
		95°F								
		TOTAL CAP. MBH	POWER INPUT	SENSIBLE CAPACITY ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68
1500	72	51.5	3.44	34.1	29.7	25.2	20.7	16.2	#N/A	#N/A
	67	45.8	3.35	40.2	35.7	31.3	26.8	22.3	17.8	13.4
	62	41.2	3.30	41.2	41.2	38.8	34.3	29.8	25.3	20.9
	57	39.9	3.35	39.9	39.9	39.9	35.4	31.0	26.5	22.0
1350	72	50.0	3.41	31.5	27.5	23.6	19.6	15.6	#N/A	#N/A
	67	44.5	3.32	37.2	33.2	29.2	25.3	2 13	17.3	13.3
	62	40.0	3.27	40.0	39.2	36.3	32.3	28.3	24.3	20.3
	57	38.8	3.32	38.8	38.8	37.5	33.5	29.6	25.6	21.6
1200	72	48.6	3.38	28.9	25.4	21.9	18.4	14.9	#N/A '	#N/A
	67	43.2	3.29	34.2	30.7	27.2	23.7	20.2	16.7	13.2
	62	38.9	3.23	38.9	37.2	33.7	30.2	26.7	23.2	19.8
	57	37.6	3.29	37.6	37.6	35.1	31.6	28.1	24.6	21.1
1050	72	46.4	3.36	26.2	23.2	20.2	17.2	14.1	#N/A	#N/A
	67	41.2	3.27	31.1	28.1	25.0	22.0	19.0	16.0	12.9
	62	37.1	3.21	36.2	34.1	31.1	28.0	25.0	22.0	18.9
	57	35.9	3.27	35.9	34.9	32.3	29.3	26.3	23.2	20.2
900	72	44.2	3.34	23.6	21.0	18.4	15.9	13.3	#N/A	#N/A
	67	39.3	3.25	28.0	25.4	22.9	20.3	17.7	15.2	12.6
	62	35.4	3.20	33.5	30.9	28.4	25.8	23.2	20.7	18.1
	57	34.2	3.25	34.2	32.1	29.5	27.0	24.4	21.8	19.3

1. These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit
2. These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to Tables 10 and 11 for the kW of the supply air blower motor.
3. These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from Tables 10 and 11, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

NOMINAL RATING ALL SENSIBLE CAPACITY

TABLE 6: COOLING CAPACITIES - MODELS DHE/DHG 036 - 105°F - 115ºF

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL 105°F								
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68
1500	72	47.6	3.65	32.3	27.8	23.3	18.9	14.4	#N/A	#N/A
	67	42.5	3.56	39.0	34.5	30.0	25.6	21.1	16.6	12.1
	62	38.0	3.49	38.0	38.0	36.6	32.1	27.6	23.1	18.7
	57	37.4	3.54	37.4	37.4	37.4	32.9	28.5	24.0	19.5
1350	72	46.5	3.62	29.7	25.8	21.8	17.8	13.8	#N/A	#N/A
	67	41.6	3.53	36.0	32.0	28.0	24.0	20.1	16.1	12.1
	62	37.1	3.46	37.1	36.6	34.1	30.1	26.1	22.2	18.2
	57	36.5	3.52	36.5	36.5	35.2	31.2	27.2	23.3	19.3
1200	72	45.4	3.60	27.2	23.7	20.2	16.7	12.2	#N/A	#N/A
	67	40.6	3.51	33.0	29.5	26.0	22.5	19.0	15.5	12.0
	62	36.2	3.44	36.2	35.2	31.7	28.2	24.7	21.2	17.7
	57	35.7	3.49	35.7	35.7	33.0	29.5	26.0	22.5	19.0
1050	72	43.2	3.57	24.6	21.6	18.5		12.5	#N/A	#N/A
	67	38.7	3.48	29.9	26.9	23.8	20.8	17.8	14.7	11.7
	62	34.5	3.41	33.9	32.1	29.0	26.0	23.0	19.9	16.9
	57	34.0	3.47	34.0	32.9	30.3	27.2	24.2	21.2	18.1
900	72	41.1	3.54	22.0	19.4	16.8	14.3	11.7	#N/A	#N/A
	67	36.7	3.45	26.8	24.2	21.7	19.1	16.5	14.0	11.4
	62	32.8	3.39	31.5	28.9	26.4	23.8	21.2	18.7	16.1
	57	32.3	3.44	32.3	30.1	27.5	24.9	22.4	19.8	17.2

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL 115°F								
		TOTAL CAP. MBH	POWER INPUT	SENSIBLE CAPACITY ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68
1500	72	43.6	3.85	30.4	26.0	21.5	17.0	12.5	#N/A	#N/A
	67	39.3	3.76	37.8	33.3	28.8	24.3	19.9	15.4	10.9
	62	34.8	3.67	34.8	34.8	34.4	29.9	25.4	20.9	16.5
	57	34.9	3.73	34.9	34.9	34.9	30.5	26.0	21.5	17.0
1350	72	42.9	3.83	28.0	24.0	20.0	16.0	12.0	#N/A	#N/A
	67	38.6	3.74	34.8	30.8	26.8	22.8	18.8	14.9	10.9
	62	34.2	3.66	34.2	34.0	32.0	28.0	24.0	20.0	16.0
	57	34.3	3.72	34.3	34.3	32.9	28.9	24.9	21.0	17.0
1200	72	42.2	3.82	25.5	22.0	18.5	15.0	11.5	#N/A	#N/A
	67	37.9	3.73	31.8	28.3	24.8	21.3	17.8	14.3	10.8
	62	33.6	3.64	33.6	33.1	29.6	26.1	22.6	19.1	15.6
	57	33.7	3.70	33.7	33.7	30.9	27.4	23.9	20.4	16.9
1050	72	40.1	3.78	22.9	19.9	16.9	13.8	10.8	#N/A	#N/A
	67	36.1	3.69	28.7	25.7	22.6	19.6	16.6	13.5	10.5
	62	32.0	3.61	31.6	30.0	27.0	23.9	20.9	17.9	14.9
	57	32.1	3.67	32.1	30.9	28.2	25.1	22.1	19.1	16.0
900	72	38.0	3.75	20.4	17.8	15.2	12.7	10.1	#N/A	#N/A
	67	34.2	3.66	25.6	23.0	20.4	17.9	15.3	12.7	10.2
	62	30.3	3.58	29.5	26.9	24.4	21.8	19.2	16.7	14.1
	57	30.4	3.64	30.4	28.0	25.4	22.9	20.3	17.7	15.2

1. These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit
2. These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to Tables 10 and 11 for the kW of the supply air blower motor.
3. These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from Tables 10 and 11, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

NOMINAL RATING ALL SENSIBLE CAPACITY

TABLE 7: COOLING CAPACITIES - MODELS DHE/DHG048

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																
		85°F									95°F							
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F							TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F					
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71
2000	72	59	3.3	46	40	34	28	23	-	-	55	3.5	43	37	32	26	20	-
	67	53	3.2	53	49	43	38	32	26	21	49	3.4	49	47	41	35	30	24
	62	47	3.2	47	47	47	42	36	30	25	44	3.4	44	44	44	38	32	26
	57	47	3.1	47	47	47	41	35	29	24	43	3.3	43	43	43	37	31	26
1800	72	58	3.3	42	37	32	27	22	-	-	54	3.5	40	35	30	25	20	-
	67	53	3.2	50	46	41	35	30	25	20	48	3.4	47	44	39	33	28	23
	62	47	3.2	47	47	46	41	36	31	26	43	3.4	43	43	43	38	33	28
	57	46	3.1	46	46	46	41	35	30	25	42	3.3	42	42	42	37	32	27
1600	72	57	3.3	39	34	30	25	21	-	-	53	3.5	37	33	28	23	19	-
	67	52	3.2	47	42	38	33	29	24	19	48	3.4	45	41	36	32	27	22
	62	46	3.2	46	46	45	41	36	32	27	42	3.4	42	42	43	39	34	30
	57	45	3.1	45	45	45	40	36	31	27	41	3.3	41	41	41	37	32	28
1400	72	54	3.2	35	31	27	23	19	-	-	51	3.5	34	30	26	22	17	-
	67	49	3.1	43	39	35	31	27	23	19	45	3.4	41	37	33	29	25	21
	62	43	3.1	43	43	42	38	34	30	26	40	3.4	40	40	40	36	32	28
	57	43	3.1	43	43	41	37	33	29	25	39	3.3	39	39	38	34	30	26
1200	72	51	3.2	32	29	25	22	18	-	-	48	3.5	30	27	23	20	16	-
	67	46	3.1	39	35	32	28	25	21	18	42	3.5	37	34	30	27	23	20
	62	41	3.1	41	41	38	35	31	28	24	38	3.4	38	38	36	33	29	26
	57	40	3.0	40	40	38	34	31	27	24	37	3.4	37	37	35	31	28	24

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																
		105°F									115°F							
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F							TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F					
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71
2000	72	50	3.8	41	35	30	24	18	-	-	45	4.0	39	33	28	22	16	-
	67	45	3.7	45	44	39	33	27	22	16	40	4.0	40	40	37	31	25	20
	62	39	3.6	39	39	39	34	28	22	17	35	3.8	35	35	35	30	24	18
	57	39	3.6	39	39	39	33	27	22	16	35	3.8	35	35	35	29	23	18
1800	72	50	3.8	38	33	28	23	18	-	-	45	4.0	36	31	26	21	16	-
	67	44	3.7	44	41	36	31	26	21	16	40	4.0	40	39	34	29	24	19
	62	39	3.6	39	39	40	35	30	25	20	35	3.9	35	35	37	32	27	22
	57	38	3.6	38	38	38	33	28	23	18	34	3.8	34	34	34	29	24	19
1600	72	49	3.8	35	31	26	21	17	-	-	45	4.1	33	29	24	20	15	-
	67	44	3.7	43	39	34	30	25	20	16	40	4.1	40	37	32	27	23	18
	62	39	3.6	39	39	41	37	32	27	23	35	3.9	35	35	39	34	30	25
	57	38	3.6	38	38	38	33	29	24	19	34	3.8	34	34	34	30	25	20
1400	72	47	3.8	32	28	24	20	16	-	-	43	4.0	30	26	22	18	14	-
	67	42	3.7	39	35	31	27	23	19	15	38	4.0	37	34	29	25	21	17
	62	37	3.6	37	37	38	33	29	25	21	33	3.8	33	33	35	31	27	23
	57	36	3.5	36	36	35	31	27	23	18	33	3.7	33	33	31	27	23	19
1200	72	44	3.7	29	25	22	18	15	-	-	41	3.9	27	24	20	17	13	-
	67	40	3.7	36	32	29	25	21	18	14	36	3.9	34	30	27	23	20	16
	62	35	3.6	35	35	34	30	27	23	20	32	3.8	32	32	32	28	25	21
	57	34	3.5	34	34	32	28	25	21	18	31	3.7	31	31	29	25	22	18

1. These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit
2. These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to Tables 10 and 11 for the kW of the supply air blower motor.
3. These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from Tables 10 and 11, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

NOMINAL RATING

ALL SENSIBLE CAPACITY

TABLE 8: COOLING CAPACITIES - MODELS DHE/DHG060

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		85°F									95°F								
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F							TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
2500	72	82	4.3	56	50	43	37	30	-	-	76	4.6	54	48	41	34	28	-	-
	67	70	4.2	67	61	54	48	41	34	28	65	4.5	65	58	51	45	38	31	25
	62	67	4.0	67	67	66	59	52	46	39	62	4.5	62	62	62	55	49	42	35
	57	66	4.0	66	66	66	59	52	46	39	61	4.4	61	61	61	54	47	41	34
2250	72	78	4.3	53	47	41	35	29	-	-	73	4.6	50	44	38	32	26	-	-
	67	67	4.2	63	57	51	45	39	33	27	62	4.5	60	54	48	42	36	30	24
	62	64	4.0	64	64	62	56	50	44	38	60	4.4	60	60	59	53	47	41	35
	57	63	4.0	63	63	63	57	51	45	39	58	4.4	58	58	58	52	46	40	34
2000	72	75	4.3	49	43	38	33	27	-	-	70	4.6	46	41	36	30	25	-	-
	67	64	4.2	58	53	48	42	37	32	26	60	4.5	56	50	45	39	34	29	23
	62	61	4.0	61	61	58	52	47	42	36	57	4.4	57	57	55	50	45	39	34
	57	60	4.0	60	60	59	54	49	43	38	56	4.4	56	56	56	50	45	39	34
1750	72	72	4.3	44	40	35	30	25	-	-	67	4.6	43	38	33	28	24	-	-
	67	62	4.2	53	49	44	39	34	30	25	58	4.5	51	46	41	37	32	27	22
	62	59	4.0	59	57	53	48	44	39	34	55	4.4	55	54	51	46	42	37	32
	57	58	4.0	58	57	55	50	45	40	36	54	4.4	54	54	51	47	42	37	32
1500	72	69	4.2	40	36	32	28	24	-	-	65	4.6	39	34	30	26	22	-	-
	67	59	4.1	48	44	40	36	32	28	23	56	4.5	46	42	38	34	30	26	21
	62	56	4.0	56	53	49	44	40	36	32	53	4.4	53	51	47	43	39	35	30
	57	55	4.0	55	54	50	46	42	37	33	52	4.4	52	51	47	43	39	35	30

AIR ON EVAPORATOR COIL		TEMPERATURE OF AIR ON CONDENSER COIL																	
		105°F									115°F								
		TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F							TOTAL CAP.[1] MBH	POWER INPUT[2]	SENSIBLE CAPACITY[3] ENTERING DRY BULB, °F						
CFM	WB °F			86	83	80	77	74	71	68			86	83	80	77	74	71	68
2500	72	68	5.0	51	44	38	31	25	-	-	61	5.3	48	41	35	28	21	-	-
	67	60	4.8	60	55	49	42	35	29	22	55	5.1	55	53	46	39	33	26	20
	62	56	4.8	56	56	56	49	43	36	29	50	5.1	50	50	50	43	37	30	23
	57	55	4.7	55	55	55	48	42	35	28	49	5.0	49	49	49	43	36	29	23
2250	72	67	4.9	48	42	36	30	24	-	-	60	5.3	45	39	33	27	21	-	-
	67	58	4.8	57	52	46	40	34	28	22	54	5.1	53	50	44	38	32	26	20
	62	55	4.7	55	55	54	48	42	36	30	49	5.0	49	49	49	43	37	31	25
	57	54	4.7	54	54	53	47	41	35	29	49	5.0	49	49	49	43	37	31	25
2000	72	65	4.9	44	39	33	28	23	-	-	60	5.2	42	36	31	26	20	-	-
	67	57	4.8	54	48	43	38	32	27	22	54	5.1	52	47	41	36	30	25	20
	62	53	4.7	53	53	52	46	41	36	30	49	5.0	49	49	48	43	37	32	26
	57	52	4.7	52	52	52	46	41	36	30	48	5.0	48	48	48	42	37	32	26
1750	72	62	4.9	40	35	31	26	21	-	-	56	5.2	38	33	28	24	19	-	-
	67	54	4.8	49	44	40	35	30	25	21	51	5.0	47	42	38	33	28	23	19
	62	51	4.7	51	50	48	43	38	33	29	46	5.0	46	46	44	39	34	30	25
	57	50	4.6	50	50	48	43	38	33	29	46	4.9	46	46	44	39	34	29	25
1500	72	59	4.9	36	32	28	24	20	-	-	53	5.2	34	30	26	22	18	-	-
	67	52	4.7	44	40	36	32	28	24	20	48	5.0	43	38	34	30	26	22	18
	62	48	4.7	48	47	43	39	35	31	27	43	4.9	43	43	40	36	32	27	23
	57	47	4.6	47	47	43	39	35	31	27	43	4.9	43	43	40	36	31	27	23

1. These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit
2. These ratings include the compressor and the condenser fan motors but not the supply air blower motor. The total condenser fan motor power input is 0.36kW. Refer to Tables 10 and 11 for the kW of the supply air blower motor.
3. These capacities are gross ratings. For net capacity, determine the kW of the supply air blower from Tables 10 and 11, multiply this value by 3.415 MBH/kW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

NOMINAL RATING

ALL SENSIBLE CAPACITY

TABLE 9: SUPPLY AIR BLOWER PERFORMANCE -DHE/DHG036 [1]

MODEL DHE/DHG	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE - IWG[2]													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
036	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

MODEL DHE/DHG	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE - IWG[2]													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS	RPM	WATTS
036	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

1. For 208 Volts multiply values by 0.95.
2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to Table 12 for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 10: SUPPLY AIR BLOWER PERFORMANCE DHE/DHG048[1] (4 TON GAS HEAT MODELS)

UNIT SIZE (MBH	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE - IWG[2]													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
048	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

UNIT SIZE (MBH	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE - IWG[2]													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
048	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

1. Models shown at 230/460 Volts with side duct connections.
2. Includes allowances for a wet evaporator coil, 1" filters, and the heat exchangers. Refer to the static resistances table for resistance values on applications other than gas/electric units with side duct airflows.

TABLE 11: SUPPLY AIR BLOWER PERFORMANCE DHE/DHG060[1] (5 TON GAS HEAT MODELS)

UNIT SIZE (MBH)	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE - IWG[2]													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
060	2500	1059	1560	1077	1590	1095	1630	1114	1650	1134	1660	1158	1685	1181	1720
	2400	1032	1405	1054	1470	1074	1525	1094	1560	1116	1595	1140	1620	1167	1640
	2300	1005	1260	1024	1275	1049	1370	1069	1440	1090	1475	1116	1505	1142	1535
	2200	980	1160	1002	1170	1022	1190	1044	1250	1066	1350	1090	1410	1117	1440
	2100	930	1060	957	1070	983	1080	1010	1100	1039	1160	1064	1260	1092	1340
	2000	877	950	908	975	941	1000	976	1020	1009	1050	1040	1100	1070	1225
	1900	-	-	-	-	894	885	940	940	980	980	1014	1020	1047	1095
	1800	-	-	-	-	855	815	903	860	950	905	988	940	1022	970
	1700	-	-	-	-	-	-	884	815	925	850	964	880	1001	910
	1600	-	-	-	-	-	-	864	770	908	805	948	835	987	870
	1500	-	-	-	-	-	-	-	-	882	740	926	780	965	830

UNIT SIZE (MBH)	AIR FLOW CFM	AVAILABLE EXTERNAL STATIC PRESSURE IWG[1]													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
060	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2400	1193	1665	-	-	-	-	-	-	-	-	-	-	-	-
	2300	1170	1580	1202	1620	-	-	-	-	-	-	-	-	-	-
	2200	1148	1480	1180	1530	-	-	-	-	-	-	-	-	-	-
	2100	1121	1385	1155	1425	1190	1475	-	-	-	-	-	-	-	-
	2000	1100	1285	1133	1340	1169	1385	1205	1445	-	-	-	-	-	-
	1900	1079	1180	1110	1240	1143	1280	1178	1330	1222	1375	-	-	-	-
	1800	1058	1060	1090	1135	1122	1190	1158	1240	1196	1295	-	-	-	-
	1700	1035	960	1071	1030	1103	1100	1134	1140	1164	1175	1197	1205	-	-
	1600	1020	900	1056	965	1088	1035	1118	1065	1145	1105	1170	1130	1198	1150
	1500	1004	860	1038	880	1070	925	1101	980	1130	1045	1158	1075	1184	1110

1. Models shown at 230/460 Volts with side duct connections.
2. Includes allowances for a wet evaporator coil, 1" filters and the heat exchangers. Refer to Table 12 for resistance values on applications other than gas / electric units with side duct airflows.

TABLE 12: ACCESSORY STATIC RESISTANCE

DESCRIPTION		EXTERNAL STATIC PRESSURE DROP RESISTANCE, IWG CFM										
		1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
ECONMIZER[1 2]		0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26	0.30
ELECTRIC HEATERS[3]	5-15 kW	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.14	0.16	0.19	0.22
	20 - 30 kW	0.06	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20	0.23	0.26
BOTTOM DUCT CONNECTIONS[1]		0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.16	0.19	0.22
COOLING ONLY[2]		0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.23	0.26	0.29	0.32

1. Deduct these resistance values from the available external static pressure shown in Tables 10 and 11.
2. The pressure through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct system is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.
3. Add these resistance values to the available static resistance values on Tables 10 and 11.

TABLE 13: MOTOR AND DRIVE DATA - BELT-DRIVE BLOWER

MODEL	BLOWER RANGE (RPM)	MOTOR[1]				ADJUSTABLE MOTOR PULLEY		FIXED BLOWER PULLEY		BELT	
		HP	RPM	FRAME SIZE	SERVICE FACTOR	PITCH DIA. (in.)	BORE (in.)	PITCH DIA. (in.)	BORE (in.)	PITCH LENGHT (in.)	DESIG-NATION
DHE/DHG 036	780 - 1120	1 1/2	1,725	56	1.15	2.4 - 3.4	7/8	5.7	1	37.3	A36
DHE/DHG048	790 - 1,120	1 1/2	1,725	56	1.15	2.4 - 3.4	7/8	5.7	1	37.3	A36
DHE/DHG060	850 - 1,220	1 1/2	1,725	56	1.15	2.4 - 3.4	7/8	5.2	1	37.3	A36

1. All motors have solid bases and are inherently protected. These motors can be selected to operate into their service factor because they are located in the moving air, upstream of any heating device

TABLE 14: ELECTRICAL DATA - BASIC UNIT

MODEL DHE/ DHG	POWER SUPPLY	VOLTAGE LIMITATIONS[1]		COMPRESSOR		COND. FAN MOTOR FLA	SUPPLY AIR AMPACITY AMPS	TOTAL UNIT AMPACITY AMPS	MAX. FUSE SIZE[2] AMPS	MAX. HACR BREAKER SIZE AMPS
		MIN.	MAX.	RLA	LRA					
036	208/230-3-60	187	253	14.1	110	2.3	5.3	25.2	35	35
	460-3-60	414	504	7.1	54	1.4	3.1	13.3	20	20
048	208/230-3-60	187	253	10.0	110.0	2.3	5.2	23.9	35	35
	460-3-60	414	504	5.2	54.0	1.4	2.6	12.4	15	15
060	208/230-3-60	187	253	16.0	137.0	2.3	6.0	28.3	40	40
	460-3-60	414	504	8.3	69.0	1.4	3.0	14.8	20	20

1. Rated in accordance with ARI Standard 110, utilization range “A”..
2. Dual element, time delay type.

TABLE 15: ELECTRICAL DATA - COOLING/ELECTRIC HEAT DHE036 & 048

MODEL DHE	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			TOTAL UNIT AMPACITY AMPS	MAX. FUSE SIZE[1] AMPS	MAX. SIZE HACR[2] AMPS
				kW	STAGES	TOTAL AMPS			
036	208-3-60	2CE04500525[3]	5.3	4.0	1	11.0	25.2	35	35
		2CE04500725[4]		5.6	1	15.6	26.2	35	35
		2CE04501025		8.0	1	22.1	34.2	35	35
		2CE04501525		11.9	2	33.1	48.1	50	50
		2CE04502025		15.9	2	44.2	61.9	70	70
	230-3-60	2CE04500525[4]	5.3	5.3	1	12.7	25.2	35	35
		2CE04500725[4]		7.5	1	18.0	29.2	35	35
		2CE04501025		10.6	1	25.5	38.5	40	40
		2CE04501525		15.9	2	38.2	54.4	60	60
		2CE04502025		21.2	2	51.0	70.4	80	80
	460-3-60	2CE04500746[4]	3.1	6.8	1	8.2	14.1	20	15
		2CE04501046[4]		10.1	1	12.1	19.1	20	20
		2CE04501546[4]		13.6	1	16.4	24.3	25	25
		2CE04502046[4]		19.5	2	23.5	33.2	35	35
048	208-3-60	2CE04500525[4]	6.0	4.0	1	11.0	26.0	35	35
		2CE04500725[4]		5.6	1	15.6	26.9	35	35
		2CE04501025		8.0	1	22.1	35.3	35	35
		2CE04501525		11.9	2	33.1	48.8	50	50
		2CE04502025		15.9	2	44.2	62.7	70	70
	230-3-60	2CE04500525[4]	6.0	5.3	1	12.7	26.0	35	35
		2CE04500725[4]		7.5	1	18.0	30.1	35	35
		2CE04501025		10.6	1	25.5	39.4	40	40
		2CE04501525		15.9	2	38.2	55.3	60	60
		2CE04502025		21.2	2	51.0	71.2	80	80
	460-3-60	2CE04500746[4]	3.0	6.8	1	8.2	14.0	15	15
		2CE04501046[4]		10.1	1	12.1	18.9	20	20
		2CE04501546[4]		13.6	1	16.4	24.2	25	25
		2CE04502046[4]		19.5	2	23.5	33.1	35	35

1. Dual element, time delay type.
2. Standard circuit breakers may be used in Canada and on applications over 60 amps where the heaters are separately fused.
3. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (e.g. Chicago), refer to Table 17 for fuse block accessories available for field installation.
4. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (e.g. Chicago), refer to Table 17 for fuse block accessories available for field installation.

TABLE 16: ELECTRIC HEAT CORRECTION FACTORS (DHE048)

NOMINAL VOLTAGE	VOLTAGE	kW CAP MULTIPLIER
208	208	1.00
240	230	0.92
480	460	0.92
600	575	0.92

TABLE 17: FUSE BLOCK ACCESSORY

2FB04700425	208/240 Volts
2FB04700546	460 Volts

TABLE 18: ELECTRICAL DATA - COOLING/ELECTRIC HEAT DHE060

MODEL DHE	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			TOTAL UNIT AMPACITY AMPS	MAX. FUSE SIZE[1] AMPS	MAX. SIZE HACR[2] AMPS
				kW	STAGES	TOTAL AMPS			
060	208-3-60	2CE04500525[3]	6.0	4.0	1	11.0	26.0	40	40
		2CE04500725[4]		5.6	1	15.6	26.9	40	40
		2CE04501025		8.0	1	22.1	35.1	40	40
		2CE04501525		11.9	2	33.1	48.9	50	50
		2CE04502025		15.9	2	44.2	62.7	70	70
		2CE04503025		22.2	2	61.7	84.6	90	90
	230-3-60	2CE04500525[4]	6.0	5.3	1	12.7	26.0	40	40
		2CE04500725[4]		7.5	1	18.0	30.1	40	40
		2CE04501025		10.6	1	25.5	39.4	40	40
		2CE04501525		15.9	2	38.2	55.3	60	60
		2CE04502025		21.2	2	51.0	71.2	80	80
		2CE04503025		29.6	2	71.2	96.5	100	100
	460-3-60	2CE04500746[4]	3.0	6.8	1	8.2	14.0	20	20
		2CE04501046[4]		10.1	1	12.1	18.9	20	20
		2CE04501546[4]		13.6	1	16.4	24.2	25	25
		2CE04502046[4]		19.5	2	23.5	33.1	35	35
		2CE04503046[4]		28.8	2	34.6	47.1	50	50

1. Dual element, time delay type.
2. Standard circuit breakers may be used in Canada and on applications over 60 amps where the heaters are separately fused.
3. These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (e.g. Chicago), refer to Table 17 for fuse block accessories available for field installation.

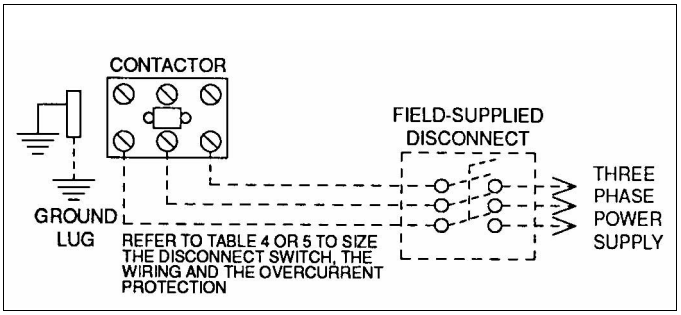

CONTACTOR
FIELD-SUPPLIED DISCONNECT
THREE PHASE POWER SUPPLY
GROUND LUG
REFER TO TABLE 4 OR 5 TO SIZE THE DISCONNECT SWITCH, THE WIRING AND THE OVERCURRENT PROTECTION

FIGURE 2 - FIELD POWER WIRING

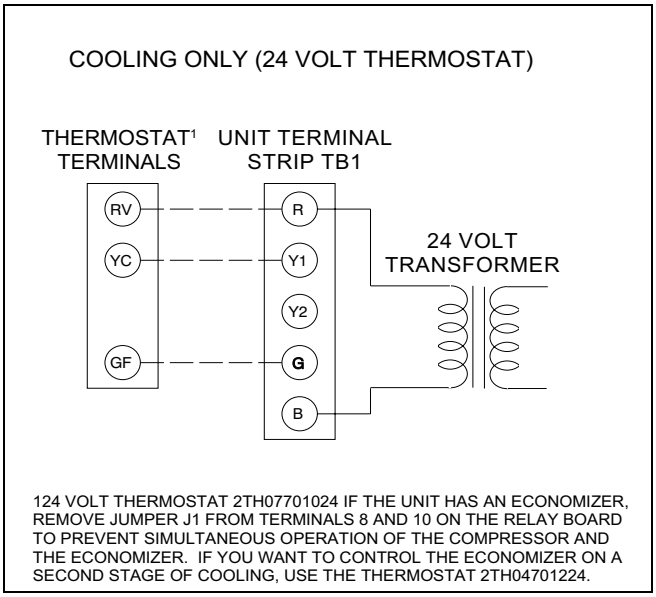

COOLING ONLY (24 VOLT THERMOSTAT)
THERMOSTAT[1] TERMINALS
UNIT TERMINAL STRIP TB1
RV
YC
GF
R
Y1
Y2
G
B
24 VOLT TRANSFORMER
124 VOLT THERMOSTAT 2TH07701024 IF THE UNIT HAS AN ECONOMIZER, REMOVE JUMPER J1 FROM TERMINALS 8 AND 10 ON THE RELAY BOARD TO PREVENT SIMULTANEOUS OPERATION OF THE COMPRESSOR AND THE ECONOMIZER. IF YOU WANT TO CONTROL THE ECONOMIZER ON A SECOND STAGE OF COOLING, USE THE THERMOSTAT 2TH04701224.

FIGURE 3 - CONTROL WIRING COOLING ONLY

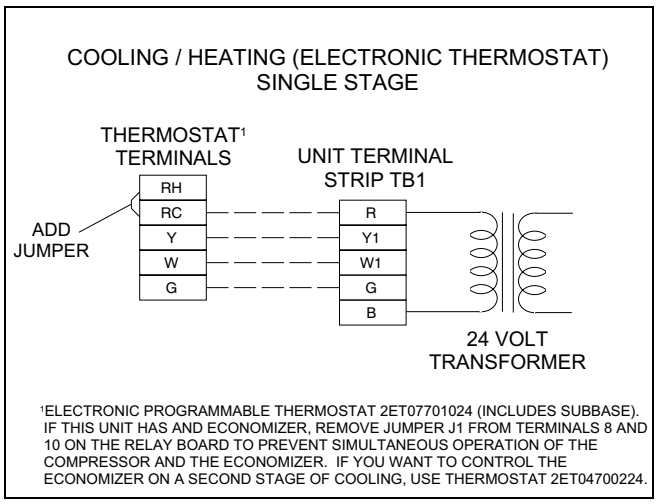

COOLING / HEATING (ELECTRONIC THERMOSTAT)
SINGLE STAGE
THERMOSTAT[1] TERMINALS
UNIT TERMINAL STRIP TB1
ADD JUMPER
RH
RC
Y
W
G
R
Y1
W1
G
B
24 VOLT TRANSFORMER
[1]ELECTRONIC PROGRAMMABLE THERMOSTAT 2ET07701024 (INCLUDES SUBBASE). IF THIS UNIT HAS AND ECONOMIZER, REMOVE JUMPER J1 FROM TERMINALS 8 AND 10 ON THE RELAY BOARD TO PREVENT SIMULTANEOUS OPERATION OF THE COMPRESSOR AND THE ECONOMIZER. IF YOU WANT TO CONTROL THE ECONOMIZER ON A SECOND STAGE OF COOLING, USE THERMOSTAT 2ET04700224.

FIGURE 4 - CONTROL WIRING SINGLE STAGE

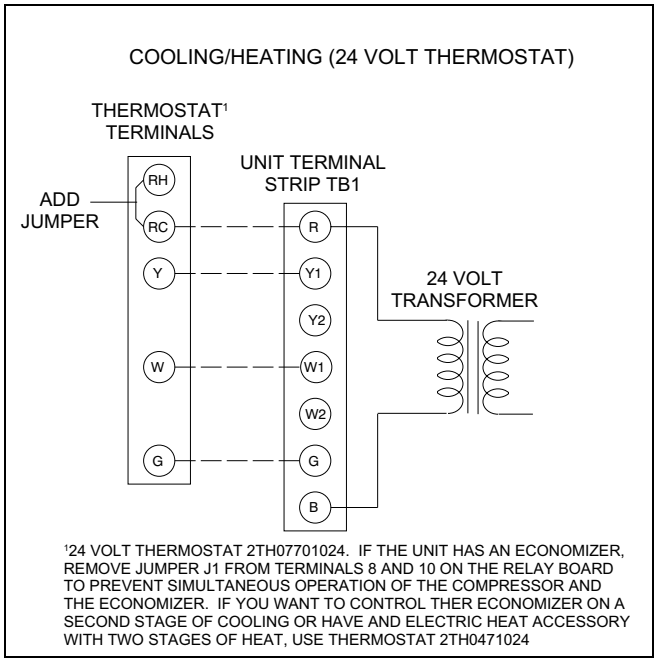

COOLING/HEATING (24 VOLT THERMOSTAT)
THERMOSTAT[1] TERMINALS
UNIT TERMINAL STRIP TB1
ADD JUMPER
RH
RC
Y
W
G
R
Y1
Y2
W1
W2
G
B
24 VOLT TRANSFORMER
[1]24 VOLT THERMOSTAT 2TH07701024. IF THE UNIT HAS AN ECONOMIZER, REMOVE JUMPER J1 FROM TERMINALS 8 AND 10 ON THE RELAY BOARD TO PREVENT SIMULTANEOUS OPERATION OF THE COMPRESSOR AND THE ECONOMIZER. IF YOU WANT TO CONTROL THER ECONOMIZER ON A SECOND STAGE OF COOLING OR HAVE AND ELECTRIC HEAT ACCESSORY WITH TWO STAGES OF HEAT, USE THERMOSTAT 2TH0471024

FIGURE 5 - CONTROL WIRING COOLING/HEATING

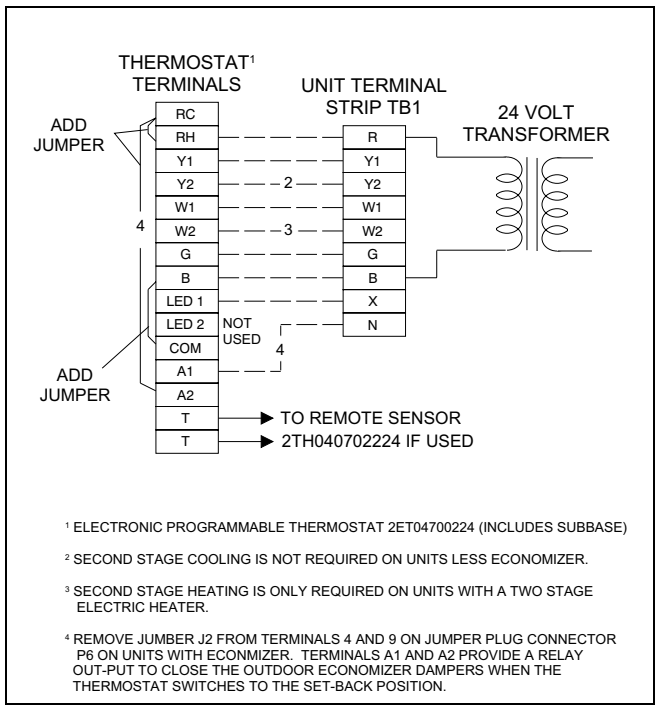
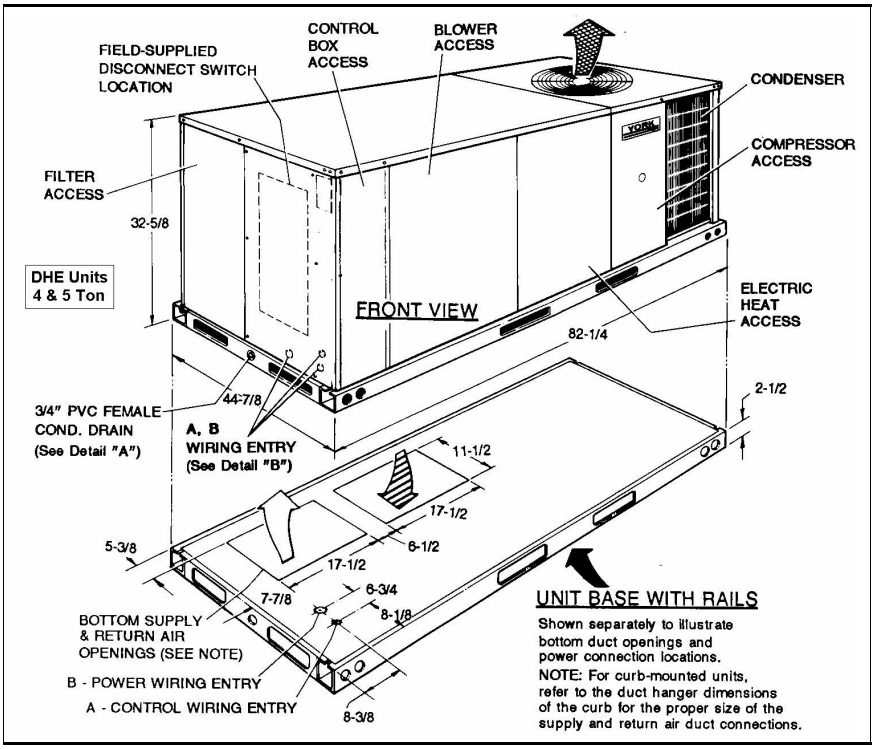
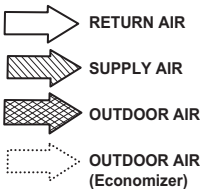


FIGURE 6 - CONTROL WIRING MULTI-STAGE





All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 7 - DHE UNIT DIMENSIONS

TABLE 19: UTILITIES ENTRY DATA

HOLE	KNOCKOUT SIZE (DIA.)	USED FOR
A	7/8"[1]	Control Wiring (Side or Bottom)[2]
B	2"	Power Wiring (Side or Bottom)
C	1-5/8"	Gas Piping (Front)
D	1-1/2"	Gas Piping (Bottom)

1. Knockouts in the bottom of the unit can be located by the slice in the insulation
2. DO NOT remove the 2" knockout ring.

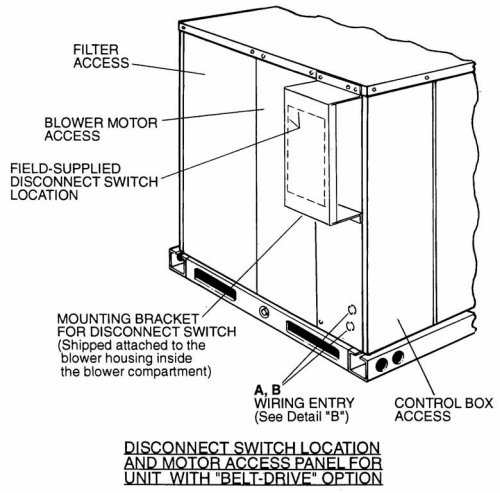
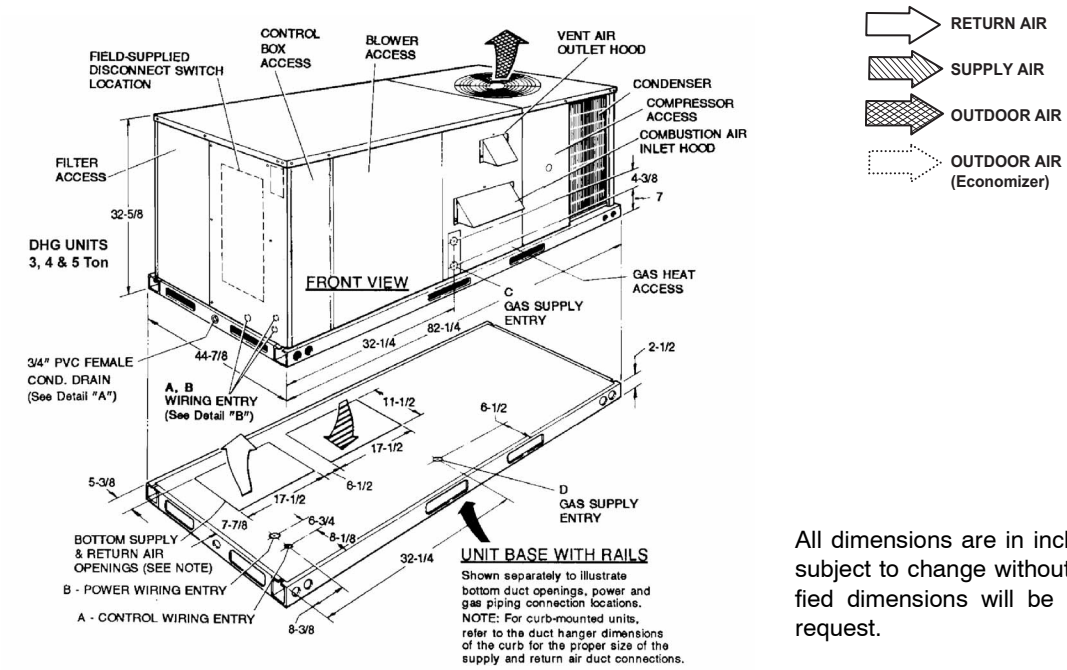

FILTER ACCESS
BLOWER MOTOR ACCESS
FIELD-SUPPLIED DISCONNECT SWITCH LOCATION
MOUNTING BRACKET FOR DISCONNECT SWITCH (Shipped attached to the blower housing inside the blower compartment)
A, B WIRING ENTRY (See Detail "B")
CONTROL BOX ACCESS
DISCONNECT SWITCH LOCATION AND MOTOR ACCESS PANEL FOR UNIT WITH "BELT-DRIVE" OPTION

FIGURE 8 - ACCESS PANELS AND DISCONNECT

NOTE: Units and ductwork of DHE models are approved for zero clearance to combustible materials when equipped with electric heaters



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 9 - UNIT DIMENSIONS DHG UNIT

TABLE 20: CLEARANCES

FRONT	DHE UNITS	24"
	DHG UNITS	32"
BACK		12" (Less Economizer) 36" (With Economizer or Fixed Air/Motorized Damper)
LEFT SIDE (Filter Access)		24" (Less Economizer) 36" (With Economizer)
RIGHT SIDE (Cond. Coil)		24"
BELOW UNIT[1]		0"
ABOVE UNIT[2]		72" (For Condenser Air Discharge)

1. Units may be installed on combustible floors made from wood or class A, B, or C roof covering material.
2. Units must be installed outdoors. Overhanging structures or shrubs should not obstruct condenser air discharge outlet.

NOTE: DHG modes must be provided a 1" clearance between any combustible material and the supply air ductwork for a distance of 2 feet from the unit.

The products of combustion must not be allowed to accumulate with a confined space and recirculate. Locate unit so that the vent air outlet hood is at least.

- Three feet above any forced air inlet located within 10 horizontal feet (excluding those integral to the unit).
- Four feet below, 4 horizontal feet from, or 1 foot above any door or gravity air inlet into the building.
- Four feet from electric meters, gas meters, regulators and relief equipment.

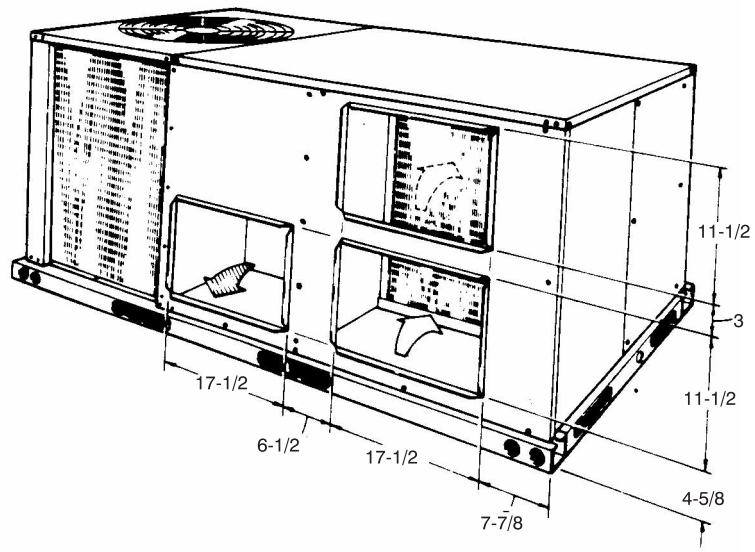


FIGURE 10 - REAR DIMENSIONS OF DHE AND DHG UNITS 3, 4 & 5 TON UNITS

Duct covers - units are shipped with all air duct openings covered.

For side duct applications:

- Remove and discard the supply and return air duct covers.
- Connect ductwork to duct flanges on the rear of the unit.

For bottom duct applications:

- remove the side supply air duct cover to gain access to the bottom supply air knockout panel.
- Remove and discard the bottom knockout panel.
- Replace the side duct cover.
- With filter section access panel removed from the unit, remove and discard the bottom return air knockout panel.
- Replace the filter Access panel.

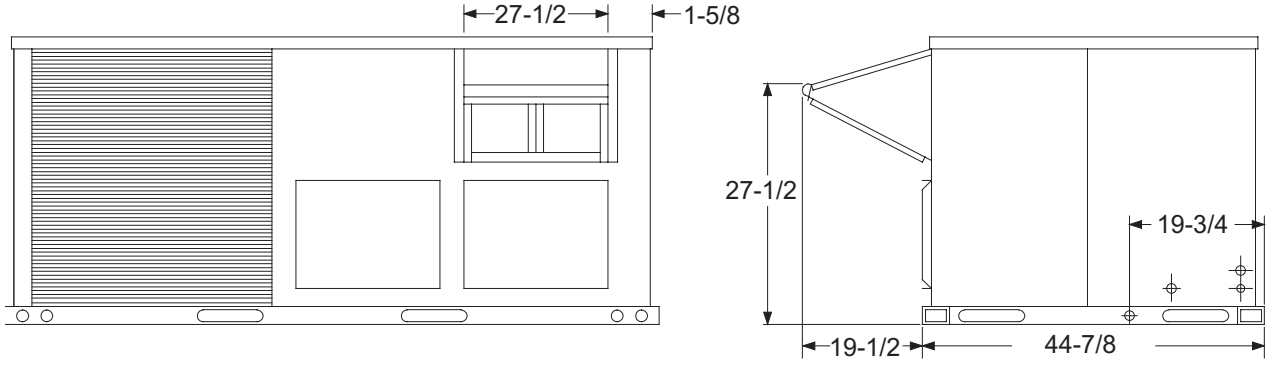
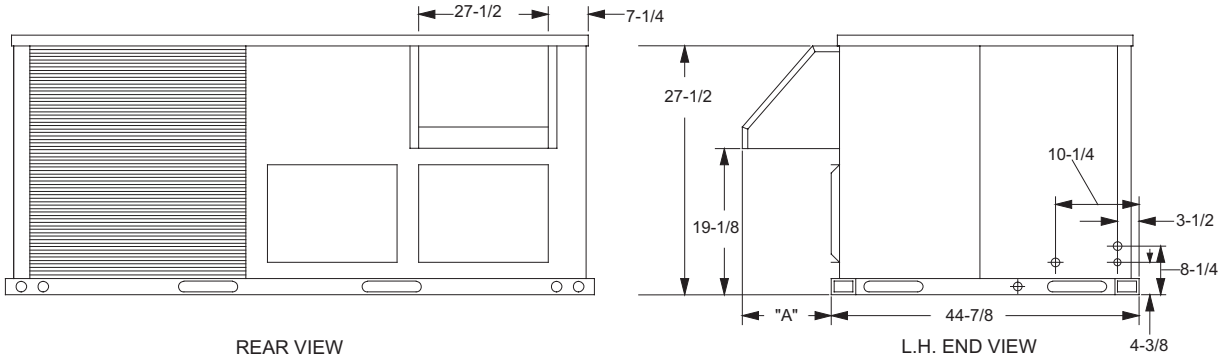


FIGURE 11 - UNIT DIMENSIONS WITH ECONOMIZER RAINHOOD



	DIMENSION "A"
FIXED OUTDOOR AIR DAMPER	12
MOTORIZED DAMPER	16-1/2

FIGURE 12 - DETAIL “B” UNIT WITH FIXED OUTDOOR AIR/MOTORIZED DAMPER RAINHOOD

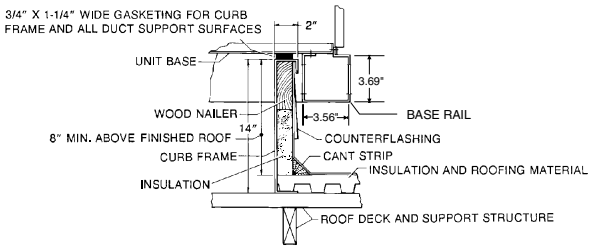


FIGURE 13 - UNIT AND CURB APPLICATION

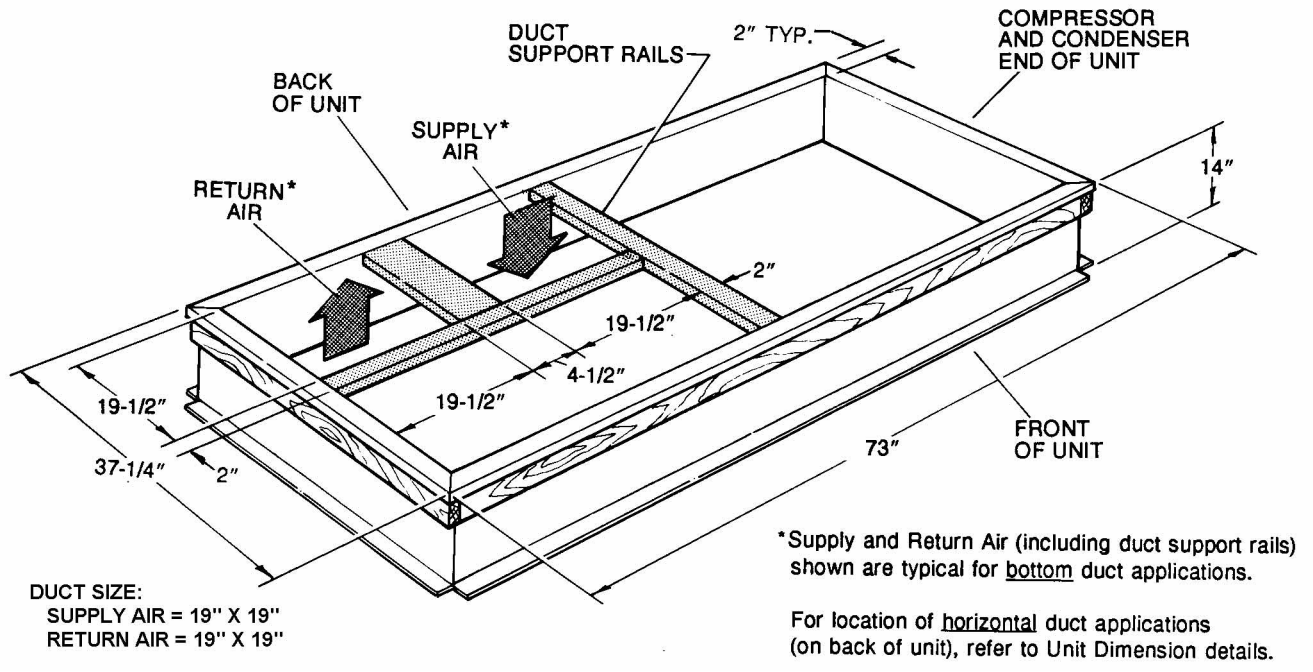


FIGURE 14 - ROOF CURB DIMENSIONS DHE/DHG 3, 4 & 5 TON

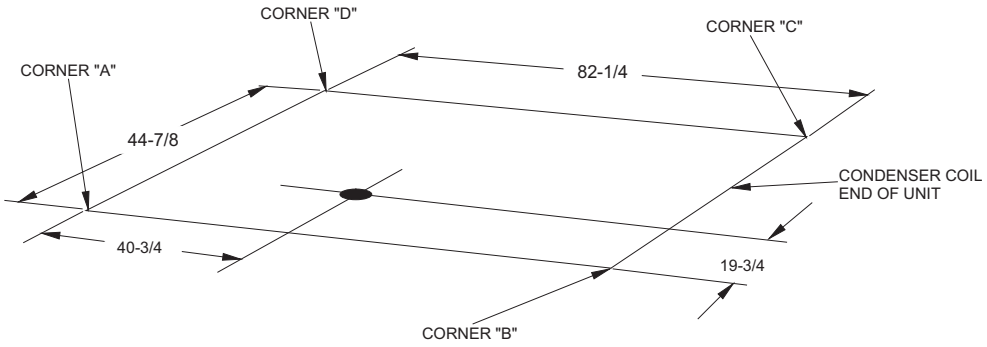


FIGURE 15 - CENTER OF GRAVITY AND CORNER WEIGHTS

TABLE 21: BASIC UNIT WEIGHT

UNIT	UNIT WEIGHT (lbs.)	CORNER WEIGHTS[1]			
		"A"	"B"	"C"	"D"
DHG036	665	188	185	145	147
DHG048	680	192	189	148	152
DHG060	715	202	199	155	159
DHE036	565	160	157	123	125
DHE048	610	172	169	133	136
DHE060	645	182	179	140	144

1. Weight = Unit with economizer and high heat.

TABLE 22: ACCESSORIES WEIGHT

DESCRIPTION		WEIGHT (lbs.)
ECONOMIZER		50
MOTORIZED OUTDOOR AIR DAMPER		26
ELECTRIC HEAT (nom. kW DHE only)	5-7 kW	18
	10-15 kW	23
	20-30 kW	28
ROOF MOUNTNG CURB		92
RELIEF/FIXED AIR DAMPER		10

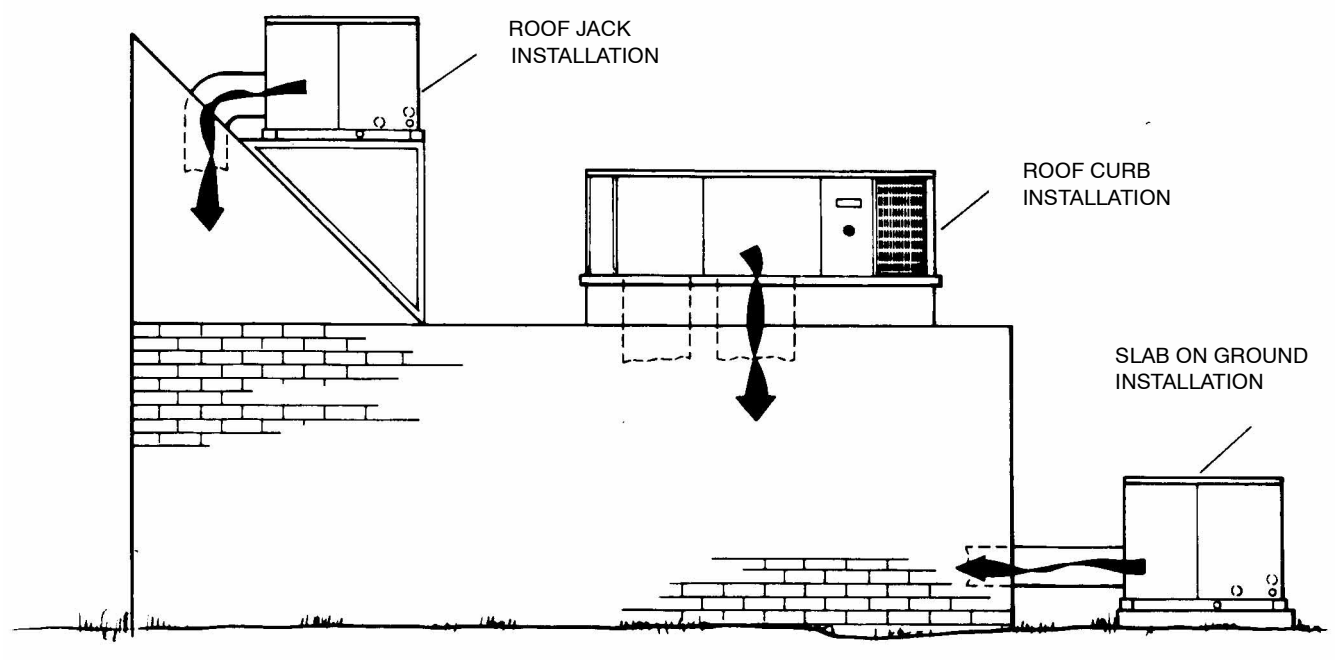


FIGURE 16 - TYPICAL APPLICATIONS

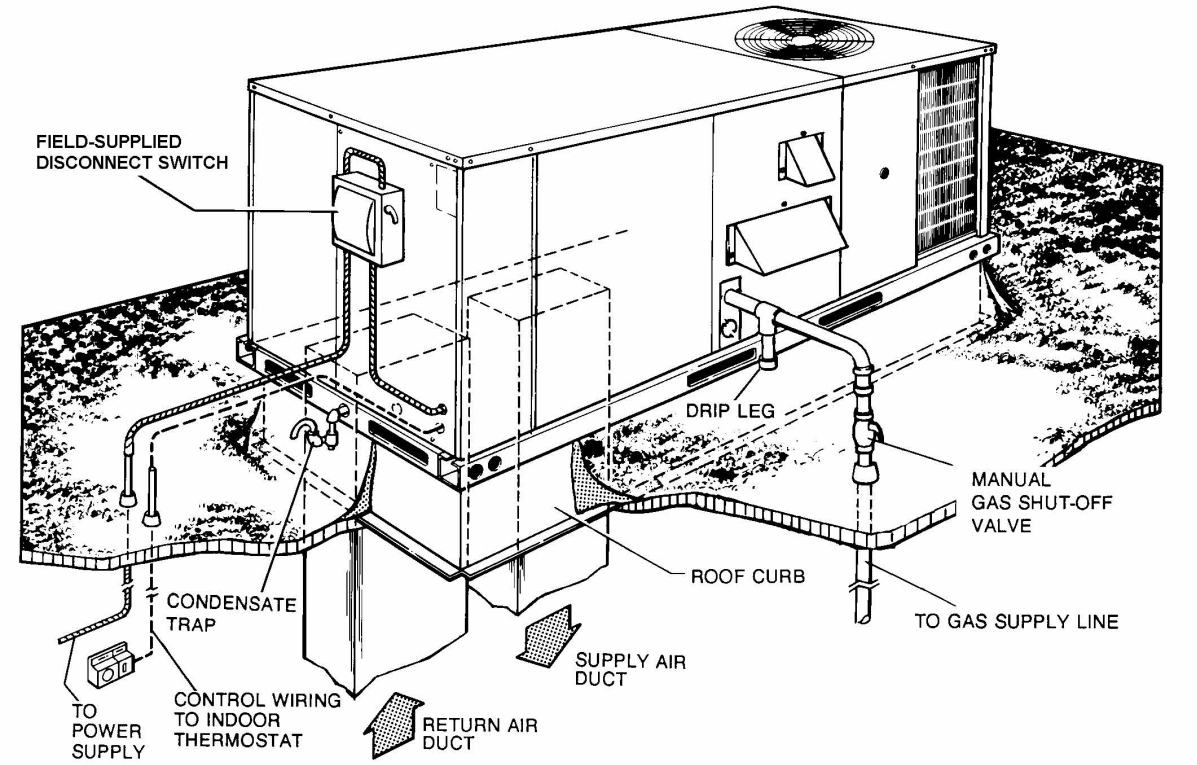


FIGURE 17 - TYPICAL ROOF-TOP INSTALLATION (DHG)

MECHANICAL SPECIFICATIONS

GENERAL DESCRIPTION

Single packaged outdoor mounted rooftop with built in field convertible duct connections for vertical discharge/return air or horizontal discharge/return air configuration. Cooling performance shall be rated in accordance with DOE and ARI test procedures. Units shall be CSA Certified to ANSIZ21.47 standards and UL 1995/CAN/CSA No. 236-M90 conditions.

EQUIPMENT

Factory-assembled, single-piece heating and cooling unit. Unit shall be factory wired, piped, charged with R-22 refrigerant and factory tested prior to shipment. Enclosed in each unit shall be a factory test log sheet consisting of the unit tested pressures, temperatures and amps, as tested prior to shipment.

Unit Cabinet:

1. Unit cabinet shall be constructed of galvanized steel, with exterior surfaces coated with a powered paint finish certified at 750 hours salt spray test per ASTM-B117 standards.
2. Indoor blower section shall be insulated with a minimum thick insulation, coated on the air side. Aluminum foil faced insulation shall be used in the furnace compartment and be fastened with ridged fasteners to prevent entering the air stream.
3. Cabinet panels shall be large size and easily removable for servicing.
4. Perimeter base rails shall be provided to assure reliable transit of equipment, rigging, and proper sealing to roof on curb applications.
5. Disposable filters (1") shall be furnished and be accessible through a removable access door sealed air tight. Units filter track shall be designed to accommodate both 1" and 2" filters.
6. Fan performance access ports shall be provided on cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating air by-pass of the coils.
7. Units vertical discharge duct configuration shall be designed to fit between standard 24" O.C. beams without modification to building structure, duct work and base unit.
8. Condensate pan shall be internally sloped and confirm to ASHARE 62-89 Standards. Condensate connection shall be a minimum of and be a rigged mount connection secured to the base unit.

Indoor (evaporator) fan assembly:

1. Fan shall be a belt driven assembly and include an adjustable-pitch motor pulley. Job site selected (B.H.P.) brake horse power shall not exceed the motors nameplate horse power rating plus the service factor. Units are designed not to operate into service factor.
2. Fan wheel shall be double-inlet type with forward-curved blades which are dynamically balanced.
3. Bearings shall be sealed, permanently lubricated for longer life and no maintenance.

Outdoor (condenser) fan assembly:

1. Outdoor (condenser) fan shall be of the direct-driven propeller type and shall discharge air vertically upward.
2. Outdoor (condenser) fan motor shall be totally enclosed with permanently lubricated bearings and internally protected to overload conditions.
3. Outdoor (condenser) fan shall have aluminum blades riveted to corrosion resistant steel spiders and shall be dynamically balanced.

Refrigerant components:

1. Compressor:
   a. Fully hermetic type, internally protected with internal high-pressure relief and over temperature protection.
   b. Factory mounted on internal spring mounted on independent dedicated mounting isolation.
2. Coils:
   a. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally-enhanced copper tubes with all joints brazed. Special Phenolic coating available as a factory option.
   b. Evaporator coil shall be of the full face active design.
3. Refrigerant Safety Components:

   Refrigerant circuit components shall include:
   a. Balance-port thermostatic expansion valve with independent circuit feed system.
   b. Filter drier/ strainer to eliminate any moisture or foreign matter.
   c. Service gage connections on suction, discharge lines to charge, evacuate, and contain refrigerant during necessary servicing.
4. Unit Controls:
   a. Unit shall be complete with self contained low-voltage control circuit protected by a fuse on the 24 volt transformer side.

b. Unit shall incorporate a lock-out circuit which provides reset capability at the space thermostat, should any of the following standard safety devices trip and shut off compressor:

I. AUTO RESET - Compressor over temperature, over current.

II. Loss-of-charge/low-pressure switch.

III. Freeze-protection thermostat, evaporator coil.

IV. High-pressure switch.

The lockout protection shall be easily disconnected at the control board, if necessary.

Heating Section:

1. Induced draft combustion with Post purge logic and energy saving direct spark ignition, redundant main gas valve with venter wheel constructed of stainless steel material.
2. The heat exchanger shall be of the tubular type constructed of a minimum of 18 gage steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance. Warranty shall be of 10-years.
3. Burners shall be of the in-shot type constructed of aluminum coated steel and contain air mixture adjustments.
4. All gas piping shall enter the unit cabinet at a single location, and be capable of side or bottom entry without major unit field modifications.
5. A Integrated control board shall provide timed control of evaporator fan functioning and burner ignition. An LED (light-emitting diode) shall provide diagnostic information.
6. Heating section shall be provided with the following minimum protection:
   a. High-temperature limit switch.
   b. Induced draft motor speed sensor.
   c. Flame roll out switch (automatic reset).
   d. Flame proving controls.

Operating Characteristics:

1. Unit shall be capable of starting and running at 125 F ambient outdoor temperature, exceeding maximum load criteria of ARI Standard 210/240.
2. Compressor with standard controls shall be capable of operation down to 45 F ambient outdoor temperature. Accessory low ambient kit operated to 0 F.
3. Unit provided with fan time delay to prevent cold air delivery before heat exchanger warms up. (Gas heat only)

Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single factory-pre drilled location and be capable of side or bottom entry without major unit field modifications

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